The kinetic coefficient of hard-sphere crystal-melt interfaces from molecular-dynamics simulations MAJEED AMINI, Department of Physics, University of Kansas, Lawrence, KS 66045 USA, BRIAN LAIRD, Department of Chemistry, University of Kansas, Lawrence, Kansas 66045 USA — The kinetic coefficient for a crystal melt interface, μ, is the ratio of the interface growth velocity to the undercooling $(T_M - T)$, where T_M is the melting point. In this work we determine the kinetic coeffiecient for the hard-sphere system by analyzing capillary fluctuations in interface position using molecular dynamics (MD) simulation [Hoyt *et al*, Mat. Sci. Eng. **R 41**, 121-163 (2003)]. We report the kinetic coefficient for the three interfaces: (100), (110), and (111). Our results for μ_{100}, μ_{110}, and μ_{111} are 1.15(4) $(k_B/(mT_M))^{1/2}$, 0.85(6) $(k_B/(mT_M))^{1/2}$, and 0.57(8) $(k_B/(mT_M))^{1/2}$, respectively, which gives the relation $\mu_{100} > \mu_{110} > \mu_{111}$. This ordering is consistent with the recent results of MD simulations for a variety of metals. The anisotropy ratios μ_{100}/μ_{110}, and μ_{100}/μ_{111} are 1.35(11), and 2.0(3), respectively. We compare our results to those of classical density functional theory (DFT) of [Mikheev and Chernov, J. Cryst. Growth **112**, 591-596 (1991)].

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